

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Carlsbad Field Office

FORM APPROVED
OMB No. 1004-0137
Expires January 31, 2018

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

OCD Artesia
Lease Serial No. 38836

SUBMIT IN TRIPLICATE - Other instructions on page 2		6. If Indian, Allottee or Tribe Name
1. Type of Well ☐ Oil Well ☒ Gas Well ☐ Other		7. IF Unit or CA/Agreement, Name and/or No. 326255
2. Name of Operator MARATHON OIL PERMIAN LLC Contact: MELISSA SZUDERA E-Mail: mszudera@marathonoil.com		8. Well Name and No. MAZER RACKHAM 20 SB FED COM 5H
3a. Address 5555 SAN FELIPE ST HOUSTON, TX 77056	3b. Phone No. (include area code) Ph: 713-296-3179	9. API Well No. 30-015-45653-00-X1
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 20 T26S R29E NENE 966FNL 570FEL 32.032902 N Lat, 104.000061 W Lon		10. Field and Pool or Exploratory Area PURPLE SAGE WOLFCAMP (GAS) Bone Spring
		11. County or Parish, State EDDY COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original APD
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Marathon Oil Permian LLC requests to make the following changes to the approved APD:

Change well name:
From: Mazer Rackham 20 WB Federal Com 5H
To: Mazer Rackham 20 SB Federal Com 5H

Change target formation:
From: Purple Sage Wolfcamp
To: Wildcat G-04 S262908A; Bone Spring

Change hole location:

NM OIL CONSERVATION
ARTESIA DISTRICT

SEP 23 2019

RECEIVED

All previous conditions of Approval still apply. DR

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #479460 verified by the BLM Well Information System
For MARATHON OIL PERMIAN LLC, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 08/22/2019 (19PP3029SE)

Name (Printed/Typed) MELISSA SZUDERA	Title REGULATORY COMPLIANCE REP
Signature (Electronic Submission)	Date 08/20/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By DYLAN ROSSMANGO	Title PETROLEUM ENGINEER	Date 08/26/2019
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office Carlsbad

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

RW 10-29-19

Additional data for EC transaction #479460 that would not fit on the form

32. Additional remarks, continued

BHL:
From: 330 FSL 670 FEL
To: 100 FSL 675 FEL

Changes to drilling program
Please see attachments.

MARATHON OIL PERMIAN LLC

DRILLING AND OPERATIONS PLAN

WELL NAME / NUMBER: MAZER RACKHAM 20 SB FED 5H

STATE: NEW MEXICO

COUNTY: EDDY

	NS Foot	NS Indicator	EW Foot	EW Indicator	TWSP	Range	Section	Aliquot/Box/Trac	Latitude (NAD83)	Longitude (NAD83)	County	State	Meridian	Lease Type	Lease Number	Elevation (ft) SS	MD (RKB)	TVD (RKB)
SHL	966	FNL	570	FEL	26S	29E	20	NENE	32.03290220	-104.00006103	EDDY	NM	NMP	Fee		2872	0	0
KOP	100	FNL	659	FEL	26S	29E	20	NWNE	32.03528054	-104.00035633	EDDY	NM	NMP	Fee		-4905	7850	7777
PPP1	100	FNL	659	FEL	26S	29E	20	NWNE	32.03528054	-104.00035633	EDDY	NM	NMP	Fee		-4905	7850	7777
PPP2	2639	FNL	1640	FEL	26S	29E	20	SWNE	32.02832385	-104.00022236	EDDY	NM	NMP	F	NMNM138836	-5595	10780	8467
BHL	100	FSL	675	FEL	26S	29E	20	SWSE	32.02136716	-104.00008838	EDDY	NM	NMP	F	NMNM138836	-5603	13304	8475

1. GEOLOGIC NAME OF SURFACE FORMATION

a. Permian/Quaternary Alluvium

2. ESTIMATED TOPS OF GEOLOGICAL MARKERS & DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS

Formation	True Vertical Depth (ft)	Measured Depth (ft)	Lithologies	Mineral Resources	Producing Formation
Rustler	358.0	358.3	Anhydrite/Dolomite	BRINE	N
Castile	954.0	954.6	Salt/Anhydrite	BRINE	N
Base of Salt	2556.0	2563.1	Base Salt	BRINE	N
Lamar	2658.0	2666.4	Limy Sands	BRINE	N
Bell Canyon	2687.0	2695.8	Sand/Shales	OIL	Y
Cherry Canyon	3777.0	3804.5	Sands/Shale	OIL	Y
Brushy Canyon	4846.0	4894.0	Sands/Carbonates	OIL	Y
Bone Spring	6490.0	6562.0	Sands/Carbonates	OIL	Y

DEEPEST EXPECTED FRESH WATER: 275' TVD

ANTICIPATED BOTTOM HOLE PRESSURE: 5,068 psi

ANTICIPATED BOTTOM HOLE TEMPERATURE: 170°F

ANTICIPATED ABNORMAL PRESSURE: N

ANTICIPATED ABNORMAL TEMPERATURE: N

3. CASING PROGRAM

String Type	Hole Size	Csg Size	Top Set MD	Bottom Set MD	Top Set TVD	TVD Bottom Set	Weight (lbs/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
Surface	17 1/2	13 3/8	0	400	0	400	54.5	155	STC	5.52	2.5	2.5
Intermediate I	12 1/4	9 5/8	0	2700	0	2691	40	155	LTC	1.74	1.15	2.19
Intermediate II	8 3/4	7	0	7850	0	7777	29	P110	BTC	2.21	1.18	1.9
Production Liner	6 1/8	4 1/2	7550	13304	7477	8475	13.5	P110	BTC	1.33	1.56	1.88

Minimum safety factors: Burst 1.125 Collapse 1.125 Tension 1.8 Wet/1.6 Dry

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3 rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2 nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

4. CEMENT PROGRAM:

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity (sks)	Yield (ft ³ /sks)	Density (ppg)	Slurry Volume (ft ³)	Excess (%)	Cement Type	Additives
Surface	Lead	4	0	0	0	1.73	13.5	0	100	Class C	
Surface	Tail	4	0	400	407	1.33	14.8	556	100	Class C	0.02 Gal/Sk Defoamer + 0.5% Extender + 1% Accelerator
Intermediate I	Lead	4	0	1700	539	2.21	12.8	932	75	Class C	0.02 Gal/Sk Defoamer + 0.5% Extender + 1% Accelerator
Intermediate I	Tail	4	1700	2700	933	1.33	14.8	470	50	Class C	0.3 % Retarder
Intermediate II	Lead	4	2400	6800	416	3.21	11	1124	70	Class C	0.85% retarder + 10% extender + 0.02 gal/sk defoamer + 2.0% Extender + 0.15% Viscosifier
Intermediate II	Tail	--	6800	7850	178	1.15	13.8	205	30	Class H	3% extender + 0.15% Dispersant + 0.03 gal/sk retarder
Production Liner	Tail	--	7550	13304	577	1.22	14.5	704	30	Class H	0.1% retarder + 3.5% extender + 0.3% fluid loss + 0.1% Dispersant

Stage tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Stage tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Pilot hole depth: N/A TVD/MD

KOP: N/A TVD/MD

Plug top	Plug Bottom	Excess (%)	Quantity (sx)	Density (ppg)	Yield (ft ³ /sx)	Water gal/sk	Slurry Description and Cement Type

Attach plugging procedure for pilot hole.

N/A

5. PRESSURE CONTROL EQUIPMENT

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12 1/4"	13 5/8	5000	Annular	x	50% of working pressure
			Blind Ram	x	5000
			Pipe Ram		
			Double Ram	x	
			Other*		
8 3/4"	13 5/8	5000	Annular	x	50% of working pressure
			Blind Ram	x	5000
			Pipe Ram		
			Double Ram	x	
			Other*		
6 1/8"	13 5/8	5000	Annular	x	50% of working pressure
			Blind Ram	x	5000
			Pipe Ram		
			Double Ram	x	
			Other*		

*Specify if additional ram is utilized.

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock, full opening safety valve / inside BOP and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.	
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
	N	Are anchors required by manufacturer?
Y	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. See attached schematic.	

6. MUD PROGRAM:

Top Depth	Bottom Depth	Mud Type	Min. Weight (ppg)	Max. Weight (ppg)	Additional Characteristics
0	400	Water Based Mud	8.4	8.8	
400	2700	Brine	9.9	10.2	
2700	7850	Cut Brine	8.8	9.8	
7850	13304	Oil Based mud	9.0	11.5	

Losses or gains in the mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times.

7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT

- a. A Kelly cock will be in the drill string at all times.
- b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.
- c. Hydrogen Sulfide detection equipment will be in operation after drilling out the surface casing shoe until the production casing is cemented. Breathing equipment will be on location upon drilling the surface casing shoe until total depth is reached. **If Hydrogen Sulfide is encountered , measured amounts and formations will be reported to the BLM**

8. LOGGING / CORING AND TESTING PROGRAM:

- A. Mud Logger: None.
- B. DST's: None.
- C. Open Hole Logs: GR while drilling from Intermediate casing shoe to TD.

9. POTENTIAL HAZARDS:

- A. H2S detection equipment will be in operation after drilling out the surface casing shoe until the production casing has been cemented. Breathing equipment will be on location from drilling out the surface shoe until production casing is cemented. If H2S is encountered the operator will comply with Onshore Order #6.
- B. No abnormal temperatures or pressures are anticipated. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.
- C. No losses are anticipated at this time.

- D. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well.
- E. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-45663	² Pool Code 97801	³ Pool Name WILDCAT G-04 S262908A; BONE SPRING
⁴ Property Code 326255	⁵ Property Name MAZER RACKHAM 20 SB FED COM	⁶ Well Number 5H
⁷ OGRID No. 372098	⁸ Operator Name MARATHON OIL PERMIAN LLC	⁹ Elevation 2872'

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	20	26S	29E		966	NORTH	570	EAST	EDDY

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	20	26S	29E		100	SOUTH	675	EAST	EDDY

¹² Dedicated Acres 160.0	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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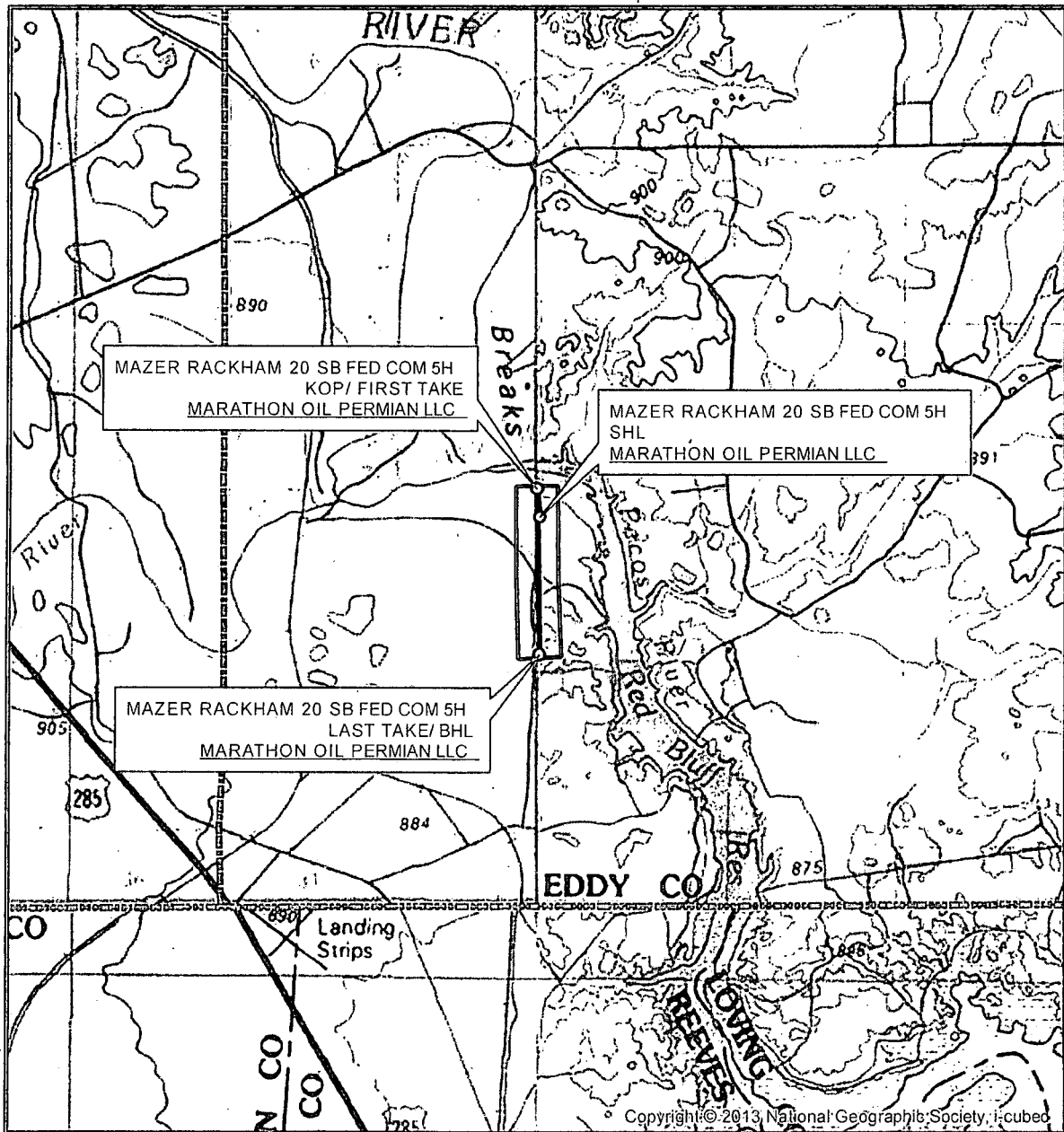
No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

Defining Well SHEET 1 OF 3 JOB No. R3893_017 REV 3 JCS 5/6/2019	CORNER COORDINATES NAD 83, SPCS NM EAST A - X: 643855.31' / Y: 376827.53' B - X: 645175.01' / Y: 376837.52' C - X: 645293.57' / Y: 371608.28' D - X: 643941.83' / Y: 371534.61'	CORNER COORDINATES NAD 27, SPCS NM EAST A - X: 602669.80' / Y: 376769.98' B - X: 603989.47' / Y: 376779.95' C - X: 604107.90' / Y: 371550.82' D - X: 602756.18' / Y: 371477.16'	¹⁷ OPERATOR CERTIFICATION <i>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</i> Signature: Date: 08/19/2019 Printed Name: MELISSA SZUDERA E-mail Address:	
	SURFACE HOLE LOCATION 966' FNL 570' FEL, SECTION 20 NAD 83, SPCS NM EAST X: 644611.29' / Y: 375867.64' LAT: 32.03290220N / LON: 104.00006103W NAD 27, SPCS NM EAST X: 603425.73' / Y: 375810.09' LAT: 32.03277720N / LON: 103.99957827W			¹⁸ SURVEYOR CERTIFICATION <i>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</i> MAY 15, 2019 Date of Survey Signature and Seal of Professional Surveyor: Certificate Number: DAVID W. MYERS, 11403
	KICK OFF POINT 100' FNL 659' FEL, SECTION 20 NAD 83, SPCS NM EAST X: 644517.11' / Y: 376732.54' LAT: 32.03528054N / LON: 104.00035633W NAD 27, SPCS NM EAST X: 603331.58' / Y: 376674.97' LAT: 32.03515557N / LON: 103.99987348W			
	FIRST TAKE POINT 100' FNL 659' FEL, SECTION 20 NAD 83, SPCS NM EAST X: 644517.11' / Y: 376732.54' LAT: 32.03528054N / LON: 104.00035633W NAD 27, SPCS NM EAST X: 603331.58' / Y: 376674.97' LAT: 32.03515557N / LON: 103.99987348W			
	LAST TAKE POINT/BOTTOM HOLE LOCATION 100' FSL 675' FEL, SECTION 20 NAD 83, SPCS NM EAST X: 644615.75' / Y: 371671.49' LAT: 32.02136716N / LON: 104.00008838W NAD 27, SPCS NM EAST X: 603430.09' / Y: 371614.02' LAT: 32.02124202N / LON: 103.99960602W			

Distances/areas relative to NAD 83 Combined Scale Factor: 0.99978647 Convergence: 00°10'35.39608"

RW 10-29-19

LOCATION VERIFICATION MAP



SEC. 20 TWP. 26-S RGE. 29-E
 SURVEY: N.M.P.M.
 COUNTY: EDDY
 OPERATOR: MARATHON OIL PERMIAN LLC
 DESCRIPTION: 966' FNL & 570' FEL
 ELEVATION: 2872'
 LEASE: MAZER RACKHAM 20 FED COM
 U.S.G.S. TOPOGRAPHIC MAP: RED BLUFF, NM, TX.

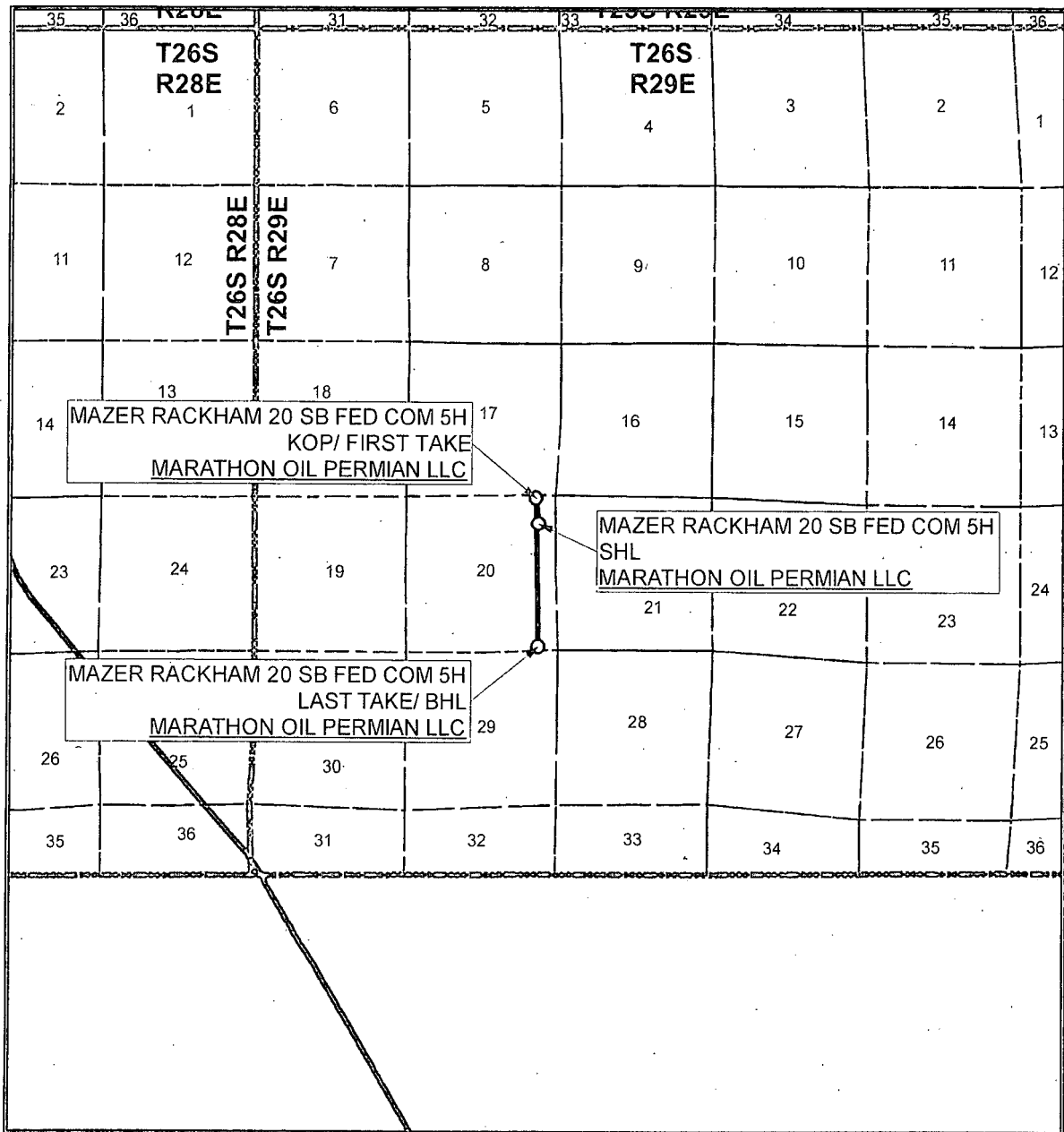
1" = 5,000'
 CONTOUR INTERVAL = 20'



SHEET 2 OF 3

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE, MONROE, LA 71201
 318-323-6900 OFFICE
 JOB No. R3893_017

VICINITY MAP



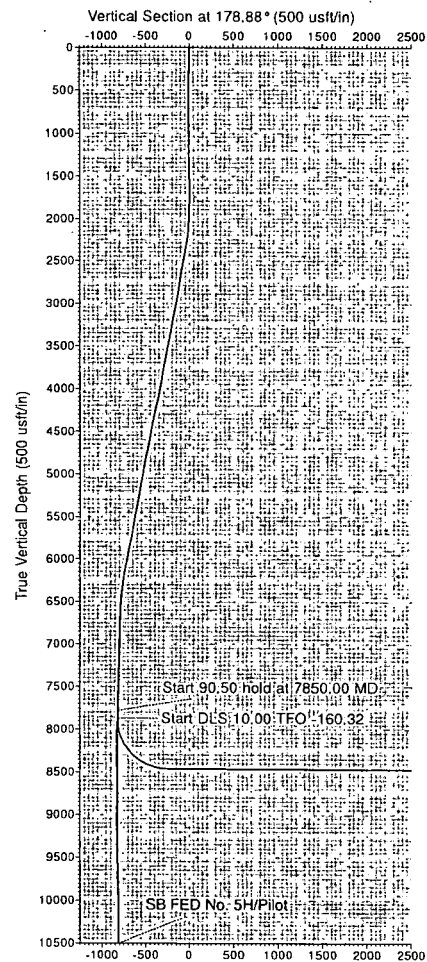
SEC. 20 TWP. 26-S RGE. 29-E
 SURVEY: N.M.P.M.
 COUNTY: EDDY
 OPERATOR: MARATHON OIL PERMIAN LLC
 DESCRIPTION: 966' FNL & 570' FEL
 ELEVATION: 2872'
 LEASE: MAZER RACKHAM 20 FED COM
 U.S.G.S. TOPOGRAPHIC MAP: RED BLUFF, NM, TX.

1" = 1 MILE



SHEET 3 OF 3

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE, MONROE, LA 71201
 318-323-6900 OFFICE
 JOB No. R3893_017



Marathon Oil
Eddy County, NM
Mazer Rackham 20
SB FED No. 5H
Lateral- Prelim Plan B
GL: 2872' + KB: 25' (PD594)



US State Plane 1927 (Exact solution)
NAD 1927 (NADCON CONUS)
Clarke 1866
New Mexico East 3001
Mean Sea Level

RKB Elevation: Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	375810.09	603425.73	32.032777	103.999578	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dip	Vsect
1	7850.00	2.10	337.38	7777.20	815.93	-104.46	0.00	-817.82
2	7940.50	2.10	337.38	7867.64	818.99	-105.74	0.00	-820.90
3	8858.36	89.81	177.05	8460.31	248.65	-83.64	10.00	-250.24
4	8950.09	89.81	178.88	8460.61	156.98	-80.39	2.00	-158.52
5	13303.99	89.81	178.88	8474.91	-4196.07	4.36	0.00	4195.35

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[MazerRack#5H]FTP	0.00	864.88	-94.15	376674.97	603331.58
[MazerRack#5H]LTP/BHL	8474.91	-4196.07	4.36	371614.02	603430.09

Azimuth Corrections

Total Magnetic Corr. (M to G): 6.72°

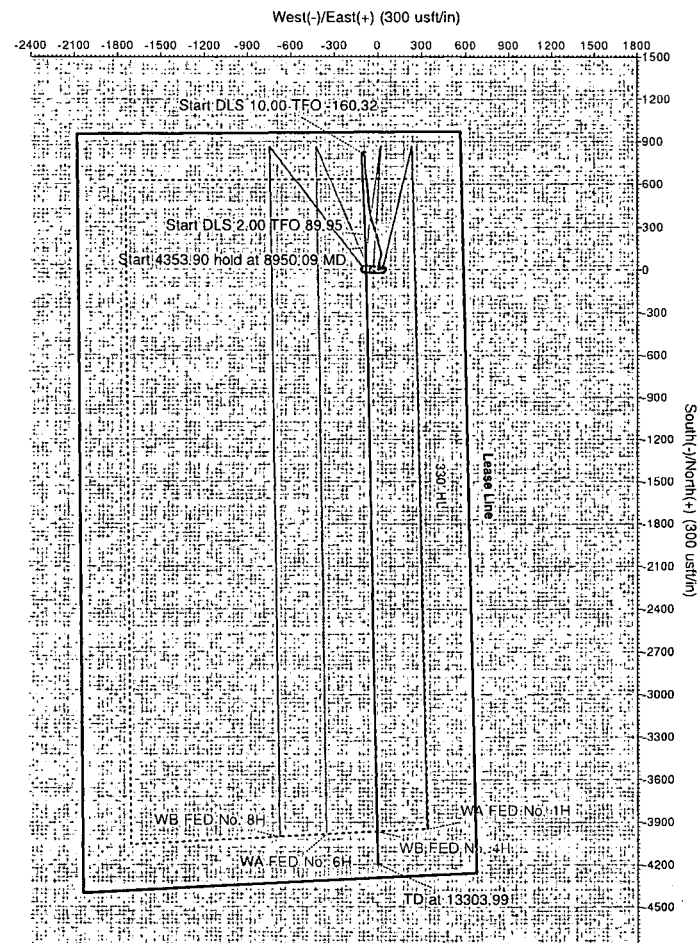
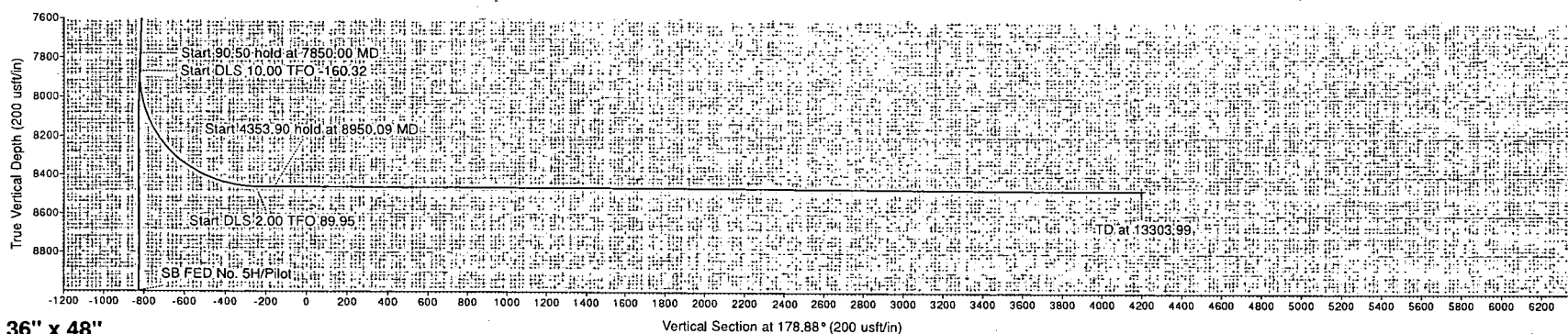
Declination (M to T): 6.90° East



Azimuths to Grid North
True North: -0.18°
Magnetic North: 6.72°

Magnetic Field
Strength: 47851.2anT
Dip Angle: 59.68°
Date: 1/7/2019
Model: HDGM

Target: 8461' TVD @ 0° VS :: 89.81° INC



36" x 48"

Company:	Marathon Oil	Local Co-ordinate Reference:	Well SB FED No. 5H
Project:	Eddy County, NM	TVD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Site:	Mazer Rackham 20	MD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Well:	SB FED No. 5H	North Reference:	Grid
Wellbore:	Lateral	Survey/Calculation Method:	Minimum Curvature
Design:	Lateral- Prelim Plan B	Database:	WellPlanner1

Project:	Eddy County, NM	System Datum:	Mean Sea Level
Map System:	US State Plane 1927 (Exact solution)		
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site:	Mazer Rackham 20		
Site Position:		Northing:	375,810.18 usft
From:	Map	Easting:	603,395.73 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.032778
		Longitude:	-103.999675
		Grid Convergence:	0.18 °

Well:	SB FED No. 5H					
Well Position	+N-S	0.00 usft	Northing:	375,810.09 usft	Latitude:	32.032777
	+E-W	0.00 usft	Easting:	603,425.73 usft	Longitude:	-103.999579
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	2,872.00 usft	

Wellbore	Lateral				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	1/7/2019	6.90	59.68	47,851.20

Design:	Lateral- Prelim Plan B			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	7,850.00
Vertical Section:	Depth From (TVD)	N-S	E-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	178.88

Survey Tool/Program	Date	5/9/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
139.00	7,850.00	Survey #1 (Pilot)	MWD+HDGM	OWSG MWD + HRGM
7,850.00	13,303.25	Lateral- Prelim Plan B (Lateral)	MWD+HDGM	OWSG MWD + HRGM

Planned Survey:									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.98	0.13	56.60	7.98	0.01	0.01	0.00	1.65	1.65	0.00
[MazerRack#5H]FTP									
139.00	2.30	56.60	138.96	1.54	2.33	-1.49	1.65	1.65	0.00
233.00	2.90	53.10	232.87	4.00	5.81	-3.89	0.66	0.64	-3.72
420.00	3.30	62.90	419.59	9.29	14.38	-9.01	0.35	0.21	5.24
511.00	2.10	66.50	510.49	11.15	18.24	-10.79	1.33	-1.32	3.96
602.00	0.80	76.80	601.46	11.96	20.39	-11.56	1.45	-1.43	11.32

Company:	Marathon Oil	Local Co-ordinate Reference:	Well SB FED No. 5H
Project:	Eddy County, NM	TVD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Site:	Mazer Rackham 20	MD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Well:	SB FED No. 5H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Lateral- Prelim Plan B	Database:	WellPlanner1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
693.00	0.70	107.10	692.45	11.94	21.54	-11.52	0.44	-0.11	33.30	
784.00	0.20	247.80	783.45	11.72	21.92	-11.29	0.95	-0.55	154.62	
874.00	0.80	271.00	873.45	11.67	21.15	-11.26	0.69	0.67	25.78	
967.00	0.90	259.10	966.44	11.54	19.78	-11.16	0.22	0.11	-12.80	
1,056.00	1.00	253.90	1,055.42	11.20	18.35	-10.84	0.15	0.11	-5.84	
1,145.00	1.20	241.60	1,144.41	10.54	16.78	-10.21	0.35	0.22	-13.82	
1,235.00	1.40	218.30	1,234.38	9.23	15.27	-8.93	0.62	0.22	-25.89	
1,325.00	1.50	204.80	1,324.36	7.30	14.10	-7.02	0.39	0.11	-15.00	
1,414.00	1.90	195.50	1,413.32	4.82	13.21	-4.56	0.54	0.45	-10.45	
1,503.00	1.30	199.30	1,502.28	2.44	12.49	-2.20	0.68	-0.67	4.27	
1,592.00	0.90	216.70	1,591.27	0.93	11.74	-0.70	0.58	-0.45	19.55	
1,681.00	0.70	249.00	1,680.26	0.17	10.81	0.04	0.54	-0.22	36.29	
1,770.00	0.90	321.50	1,769.25	0.53	9.87	-0.33	1.08	0.22	81.46	
1,860.00	1.00	343.70	1,859.24	1.83	9.21	-1.65	0.42	0.11	24.67	
1,949.00	1.80	359.80	1,948.21	3.98	8.98	-3.80	0.99	0.90	18.09	
2,039.00	3.00	356.00	2,038.13	7.74	8.81	-7.56	1.34	1.33	-4.22	
2,128.00	4.60	357.60	2,126.93	13.63	8.50	-13.46	1.80	1.80	1.80	
2,218.00	6.40	6.00	2,216.52	22.22	8.88	-22.05	2.19	2.00	9.33	
2,307.00	9.50	2.80	2,304.65	34.50	9.75	-34.30	3.52	3.48	-3.60	
2,396.00	11.80	4.60	2,392.11	50.90	10.84	-50.68	2.61	2.58	2.02	
2,486.00	11.40	15.80	2,480.28	68.64	14.00	-68.35	2.54	-0.44	12.44	
2,575.00	9.90	18.60	2,567.75	84.35	18.84	-83.97	1.78	-1.69	3.15	
2,639.00	8.90	11.50	2,630.89	94.42	21.58	-93.98	2.39	-1.56	-11.09	
2,757.00	7.90	359.70	2,747.63	111.48	23.36	-111.00	1.68	-0.85	-10.00	
2,846.00	8.80	342.90	2,835.70	124.10	21.32	-123.66	2.91	1.01	-18.88	
2,936.00	10.40	345.90	2,924.44	138.56	17.32	-138.19	1.86	1.78	3.33	
3,025.00	11.00	345.60	3,011.89	154.58	13.25	-154.29	0.68	0.67	-0.34	
3,114.00	11.00	346.50	3,099.26	171.06	9.16	-170.84	0.19	0.00	1.01	
3,204.00	11.10	345.40	3,187.59	187.79	4.97	-187.66	0.26	0.11	-1.22	
3,293.00	11.50	346.70	3,274.86	204.71	0.77	-204.66	0.53	0.45	1.46	
3,382.00	11.20	345.80	3,362.12	221.73	-3.39	-221.75	0.39	-0.34	-1.01	
3,472.00	11.20	344.10	3,450.41	238.61	-7.93	-238.72	0.37	0.00	-1.89	
3,561.00	11.40	343.60	3,537.68	255.36	-12.78	-255.56	0.25	0.22	-0.56	
3,651.00	10.70	342.50	3,626.01	271.86	-17.81	-272.15	0.81	-0.78	-1.22	
3,740.00	10.10	340.90	3,713.55	287.11	-22.84	-287.50	0.75	-0.67	-1.80	
3,830.00	11.10	342.30	3,802.01	302.82	-28.06	-303.31	1.15	1.11	1.56	
3,914.00	11.10	342.50	3,884.44	318.24	-32.95	-318.82	0.05	0.00	0.24	
4,008.00	11.30	341.60	3,976.65	335.61	-38.58	-336.30	0.28	0.21	-0.96	
4,097.00	11.50	346.90	4,063.90	352.52	-43.34	-353.30	1.20	0.22	5.96	
4,187.00	11.70	352.20	4,152.06	370.30	-46.61	-371.14	1.20	0.22	5.89	
4,276.00	11.30	351.20	4,239.28	387.86	-49.17	-388.75	0.50	-0.45	-1.12	
4,365.00	11.30	350.20	4,326.55	405.07	-51.99	-406.01	0.22	0.00	-1.12	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well SB FED No. 5H
Project:	Eddy County, NM	TVD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Site:	Mazer Rackham 20	MD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Well:	SB FED No. 5H	North Reference:	Grid
Wellbore:	Lateral	Survey Calculation Method:	Minimum Curvature
Design:	Lateral- Prelim Plan B	Database:	WellPlanner1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	N-S (usft)	E-W (usft)	Vertical Section (usft)	Dogleg Rate (%/100usft)	Build Rate (%/100usft)	Turn Rate (%/100usft)	
4,455.00	11.00	349.10	4,414.85	422.19	-55.12	-423.19	0.41	-0.33	-1.22	
4,544.00	10.70	347.70	4,502.26	438.60	-58.48	-439.66	0.45	-0.34	-1.57	
4,633.00	10.60	354.10	4,589.73	454.81	-61.08	-455.92	1.33	-0.11	7.19	
4,722.00	11.20	359.20	4,677.13	471.60	-62.04	-472.72	1.28	0.67	5.73	
4,812.00	11.10	357.90	4,765.43	489.00	-62.48	-490.13	0.30	-0.11	-1.44	
4,901.00	10.60	356.40	4,852.84	505.73	-63.31	-506.87	0.65	-0.56	-1.69	
4,990.00	9.90	355.20	4,940.42	521.52	-64.47	-522.68	0.82	-0.79	-1.35	
5,079.00	10.10	355.40	5,028.07	536.93	-65.73	-538.11	0.23	0.22	0.22	
5,169.00	9.80	355.10	5,116.71	552.42	-67.02	-553.63	0.34	-0.33	-0.33	
5,258.00	9.50	353.40	5,204.45	567.27	-68.51	-568.50	0.46	-0.34	-1.91	
5,347.00	10.50	351.90	5,292.10	582.59	-70.50	-583.86	1.16	1.12	-1.69	
5,437.00	10.60	350.60	5,380.58	598.88	-73.01	-600.19	0.29	0.11	-1.44	
5,526.00	9.80	349.50	5,468.17	614.40	-75.72	-615.76	0.93	-0.90	-1.24	
5,616.00	9.20	349.90	5,556.94	629.01	-78.38	-630.43	0.67	-0.67	0.44	
5,705.00	9.90	351.40	5,644.70	643.58	-80.77	-645.04	0.83	0.79	1.69	
5,794.00	11.50	354.50	5,732.15	659.98	-82.77	-661.47	1.91	1.80	3.48	
5,883.00	11.30	354.00	5,819.40	677.48	-84.53	-679.01	0.25	-0.22	-0.56	
5,972.00	11.30	355.20	5,906.67	694.84	-86.17	-696.40	0.26	0.00	1.35	
6,061.00	10.90	355.70	5,994.01	711.93	-87.53	-713.50	0.46	-0.45	0.56	
6,151.00	10.20	356.10	6,082.48	728.36	-88.71	-729.96	0.78	-0.78	0.44	
6,240.00	9.10	355.90	6,170.22	743.24	-89.75	-744.86	1.24	-1.24	-0.22	
6,329.00	8.40	355.50	6,258.19	756.74	-90.76	-758.37	0.79	-0.79	-0.45	
6,419.00	6.10	359.00	6,347.46	768.08	-91.36	-769.72	2.60	-2.56	3.89	
6,508.00	4.30	2.80	6,436.09	776.14	-91.28	-777.78	2.06	-2.02	4.27	
6,597.00	3.70	359.90	6,524.88	782.35	-91.12	-783.98	0.71	-0.67	-3.26	
6,687.00	2.60	9.20	6,614.74	787.27	-90.80	-788.89	1.34	-1.22	10.33	
6,776.00	2.10	359.60	6,703.66	790.89	-90.49	-792.51	0.71	-0.56	-10.79	
6,866.00	1.10	10.00	6,793.63	793.39	-90.35	-795.00	1.15	-1.11	11.56	
6,955.00	0.70	7.20	6,882.62	794.77	-90.14	-796.38	0.45	-0.45	-3.15	
7,044.00	1.50	336.50	6,971.60	796.38	-90.53	-797.99	1.09	0.90	-34.49	
7,134.00	1.40	317.50	7,061.57	798.27	-91.74	-799.91	0.54	-0.11	-21.11	
7,223.00	1.10	311.10	7,150.55	799.63	-93.12	-801.30	0.37	-0.34	-7.19	
7,312.00	1.40	314.00	7,239.53	800.95	-94.55	-802.64	0.34	0.34	3.26	
7,401.00	1.80	295.00	7,328.49	802.29	-96.60	-804.03	0.74	0.45	-21.35	
7,491.00	2.20	316.90	7,418.44	804.15	-99.06	-805.94	0.95	0.44	24.33	
7,580.00	2.20	325.00	7,507.38	806.80	-101.21	-808.62	0.35	0.00	9.10	
7,669.00	2.10	339.20	7,596.31	809.72	-102.76	-811.58	0.61	-0.11	15.96	
7,759.00	2.00	351.40	7,686.26	812.82	-103.59	-814.69	0.50	-0.11	13.56	
7,848.00	2.10	337.70	7,775.20	815.86	-104.44	-817.75	0.56	0.11	-15.39	
7,850.00	2.10	337.38	7,777.20	815.93	-104.46	-817.82	0.58	-0.07	-15.80	
7,900.00	2.10	337.38	7,827.17	817.62	-105.17	-819.52	0.00	0.00	0.00	
7,940.50	2.10	337.38	7,867.64	818.99	-105.74	-820.90	0.00	0.00	0.00	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well SB FED No. 5H
Project:	Eddy County, NM	TVD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Site:	Mazer Rackham 20	MD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Well:	SB FED No. 5H	North Reference:	Grid
Wellbore:	Lateral	Survey/Calculation Method:	Minimum Curvature
Design:	Lateral- Prelim Plan B	Database:	WellPlanner1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	N/S (usft)	E/W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
7,950.00	1.25	322.51	7,877.13	819.23	-105.87	-821.14	10.00	-8.98	-156.61	
8,000.00	4.04	187.11	7,927.10	817.92	-106.42	-819.84	10.00	5.58	-270.79	
8,050.00	9.00	181.51	7,976.76	812.26	-106.74	-814.19	10.00	9.93	-11.20	
8,100.00	13.99	179.88	8,025.74	802.29	-106.83	-804.23	10.00	9.98	-3.26	
8,150.00	18.99	179.10	8,073.67	788.11	-106.69	-790.04	10.00	9.99	-1.57	
8,200.00	23.98	178.64	8,120.18	769.81	-106.32	-771.74	10.00	9.99	-0.93	
8,250.00	28.98	178.32	8,164.92	747.52	-105.72	-749.45	10.00	10.00	-0.63	
8,300.00	33.98	178.10	8,207.55	721.43	-104.90	-723.35	10.00	10.00	-0.45	
8,350.00	38.98	177.92	8,247.74	691.74	-103.87	-693.63	10.00	10.00	-0.35	
8,400.00	43.98	177.78	8,285.19	658.65	-102.62	-660.53	10.00	10.00	-0.28	
8,450.00	48.98	177.66	8,319.61	622.44	-101.18	-624.30	10.00	10.00	-0.24	
8,500.00	53.98	177.56	8,350.74	583.36	-99.55	-585.20	10.00	10.00	-0.20	
8,550.00	58.98	177.47	8,378.34	541.73	-97.75	-543.54	10.00	10.00	-0.18	
8,600.00	63.98	177.39	8,402.21	497.86	-95.78	-499.64	10.00	10.00	-0.16	
8,650.00	68.98	177.32	8,422.16	452.08	-93.66	-453.82	10.00	10.00	-0.15	
8,700.00	73.98	177.25	8,438.04	404.74	-91.42	-406.45	10.00	10.00	-0.14	
8,750.00	78.97	177.19	8,449.73	356.20	-89.06	-357.87	10.00	10.00	-0.13	
8,800.00	83.97	177.12	8,457.14	306.83	-86.60	-308.46	10.00	10.00	-0.13	
8,850.00	88.97	177.06	8,460.22	257.00	-84.07	-258.60	10.00	10.00	-0.12	
8,858.36	89.81	177.05	8,460.31	248.65	-83.64	-250.24	10.00	10.00	-0.12	
8,900.00	89.81	177.88	8,460.44	207.06	-81.80	-208.61	2.00	0.00	2.00	
8,950.09	89.81	178.88	8,460.61	156.98	-80.39	-158.52	2.00	0.00	2.00	
9,000.00	89.81	178.88	8,460.77	107.09	-79.42	-108.62	0.00	0.00	0.00	
9,100.00	89.81	178.88	8,461.10	7.11	-77.47	-8.62	0.00	0.00	0.00	
9,200.00	89.81	178.88	8,461.43	-92.88	-75.52	91.38	0.00	0.00	0.00	
9,300.00	89.81	178.88	8,461.76	-192.86	-73.58	191.38	0.00	0.00	0.00	
9,400.00	89.81	178.88	8,462.09	-292.84	-71.63	291.38	0.00	0.00	0.00	
9,500.00	89.81	178.88	8,462.41	-392.82	-69.68	391.38	0.00	0.00	0.00	
9,600.00	89.81	178.88	8,462.74	-492.80	-67.74	491.38	0.00	0.00	0.00	
9,700.00	89.81	178.88	8,463.07	-592.78	-65.79	591.38	0.00	0.00	0.00	
9,800.00	89.81	178.88	8,463.40	-692.76	-63.85	691.38	0.00	0.00	0.00	
9,900.00	89.81	178.88	8,463.73	-792.74	-61.90	791.38	0.00	0.00	0.00	
10,000.00	89.81	178.88	8,464.06	-892.72	-59.95	891.38	0.00	0.00	0.00	
10,100.00	89.81	178.88	8,464.39	-992.70	-58.01	991.38	0.00	0.00	0.00	
10,200.00	89.81	178.88	8,464.71	-1,092.68	-56.06	1,091.38	0.00	0.00	0.00	
10,300.00	89.81	178.88	8,465.04	-1,192.66	-54.11	1,191.38	0.00	0.00	0.00	
10,400.00	89.81	178.88	8,465.37	-1,292.64	-52.17	1,291.37	0.00	0.00	0.00	
10,500.00	89.81	178.88	8,465.70	-1,392.62	-50.22	1,391.37	0.00	0.00	0.00	
10,600.00	89.81	178.88	8,466.03	-1,492.60	-48.27	1,491.37	0.00	0.00	0.00	
10,700.00	89.81	178.88	8,466.36	-1,592.58	-46.33	1,591.37	0.00	0.00	0.00	
10,800.00	89.81	178.88	8,466.68	-1,692.56	-44.38	1,691.37	0.00	0.00	0.00	
10,900.00	89.81	178.88	8,467.01	-1,792.54	-42.43	1,791.37	0.00	0.00	0.00	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well SB FED No. 5H
Project:	Eddy County, NM	TVD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Site:	Mazer Rackham 20	MD Reference:	Well @ 2897.00usft (GL: 2872' + KB: 25' (PD594))
Well:	SB FED No. 5H	North Reference:	Grid
Wellbore:	Lateral	Survey/Calculation Method:	Minimum Curvature
Design:	Lateral- Prelim Plan B	Database:	WellPlanner1

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
11,000.00	89.81	178.88	8,467.34	-1,892.52	-40.49	1,891.37	0.00	0.00	0.00	
11,100.00	89.81	178.88	8,467.67	-1,992.51	-38.54	1,991.37	0.00	0.00	0.00	
11,200.00	89.81	178.88	8,468.00	-2,092.49	-36.59	2,091.37	0.00	0.00	0.00	
11,300.00	89.81	178.88	8,468.33	-2,192.47	-34.65	2,191.37	0.00	0.00	0.00	
11,400.00	89.81	178.88	8,468.66	-2,292.45	-32.70	2,291.37	0.00	0.00	0.00	
11,500.00	89.81	178.88	8,468.98	-2,392.43	-30.75	2,391.37	0.00	0.00	0.00	
11,600.00	89.81	178.88	8,469.31	-2,492.41	-28.81	2,491.37	0.00	0.00	0.00	
11,700.00	89.81	178.88	8,469.64	-2,592.39	-26.86	2,591.37	0.00	0.00	0.00	
11,800.00	89.81	178.88	8,469.97	-2,692.37	-24.92	2,691.37	0.00	0.00	0.00	
11,900.00	89.81	178.88	8,470.30	-2,792.35	-22.97	2,791.37	0.00	0.00	0.00	
12,000.00	89.81	178.88	8,470.63	-2,892.33	-21.02	2,891.37	0.00	0.00	0.00	
12,100.00	89.81	178.88	8,470.96	-2,992.31	-19.08	2,991.37	0.00	0.00	0.00	
12,200.00	89.81	178.88	8,471.28	-3,092.29	-17.13	3,091.37	0.00	0.00	0.00	
12,300.00	89.81	178.88	8,471.61	-3,192.27	-15.18	3,191.36	0.00	0.00	0.00	
12,400.00	89.81	178.88	8,471.94	-3,292.25	-13.24	3,291.36	0.00	0.00	0.00	
12,500.00	89.81	178.88	8,472.27	-3,392.23	-11.29	3,391.36	0.00	0.00	0.00	
12,600.00	89.81	178.88	8,472.60	-3,492.21	-9.34	3,491.36	0.00	0.00	0.00	
12,700.00	89.81	178.88	8,472.93	-3,592.19	-7.40	3,591.36	0.00	0.00	0.00	
12,800.00	89.81	178.88	8,473.25	-3,692.17	-5.45	3,691.36	0.00	0.00	0.00	
12,900.00	89.81	178.88	8,473.58	-3,792.15	-3.50	3,791.36	0.00	0.00	0.00	
13,000.00	89.81	178.88	8,473.91	-3,892.13	-1.56	3,891.36	0.00	0.00	0.00	
13,100.00	89.81	178.88	8,474.24	-3,992.12	0.39	3,991.36	0.00	0.00	0.00	
13,200.00	89.81	178.88	8,474.57	-4,092.10	2.34	4,091.36	0.00	0.00	0.00	
13,303.99	89.81	178.88	8,474.91	-4,196.07	4.36	4,195.35	0.00	0.00	0.00	
[MazerRack#5H]LTP/BHL										

Design Targets										
Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
[MazerRack#5H]FTP		0.00	0.00	0.00	864.88	-94.15	376,674.97	603,331.58	32.035156	-103.999874
- plan misses target center by 869.99usft at 0.46usft MD (0.46 TVD, 0.00 N, 0.00 E)										
- Point										
[MazerRack#5H]LTP/BH		0.00	0.00	8,474.91	-4,196.07	4.36	371,614.02	603,430.09	32.021242	-103.999606
- plan hits target center										
- Point										

Checked By: _____	Approved By: _____	Date: _____
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